

VOC Sensor SGP40

Experts in Environmental Sensing

For indoor air quality applications

- Outstanding long-term stability
- Very low power consumption, extended supply voltage range
- Digital output signal via I²C interface
- Powerful and robust VOC Algorithm

VOC Sensor SGP40

The SGP40 is an integrated CMOSens® sensor system on a single chip based on a metal-oxide sensor. It provides a humidity-compensated indoor air quality signal via a digital I²C interface. By relying on Sensirion's proven MOXSens® Technology, the sensor's unmatched robustness against contamination by siloxanes results in outstanding long-term stability in terms of sensitivity and response time. Pushing the sensing material and micro-hotplate technology to the next level, the SGP40 offers a drastic reduction in power consumption, making it suitable for battery-driven applications as well. Sensirion's industry-leading production processes guarantee high reproducibility and reliability.



Sensirion's powerful VOC Algorithm analyzes VOC events detected by the SGP40 VOC sensor and maps them to a VOC Index. This VOC Index provides a practical quantification of VOC events relative to each individual sensor's average indoor environment. In this way, it behaves similarly to the human nose, which is highly susceptible to changes in odor, but it also detects VOC events that are not perceived by humans.

The VOC Index indicates to what extent the indoor air quality has deteriorated or improved compared to the sensor's average VOC environment. This information can be used, e.g., for gradually controlling the fan of an air treatment device or to provide users with feedback on their daily activity profile.

APPLICATIONS

The SGP40 has been designed for use in various applications and devices, such as:

- Air purifiers
- Kitchen hoods
- Demand-controlled ventilation
- Thermostats
- Indoor air quality monitoring

FEATURES

Both the SGP40 and VOC Algorithm offer distinguishing features (detailed below) that help users assess and improve their air quality.

1. Complete sensor solution for detecting VOC events

- Simple interface, powerful VOC Algorithm
- Easy integration of driver package

2. Proven performance improved

- 2nd generation
- Low device-to-device variation under field or lab conditions
- Fast start-up behavior

3. Reliable and accurate long-term user experience

- Robust hardware
- Stable and repeatable signal output over lifetime
- Smart adaptation to any indoor environment

TECHNOLOGY AND BENEFITS

Technology	Benefits
Excellent longevity of > 10 years	Reliable sensor hardware
VOC Index driver	No signal processing programming by customer required
On-chip humidity compensation	Optimal performance in various environments
Low heat emission	Enhanced precision of RH&T readings, less backgrounds
Small footprint	Fits into every device
High sensitivity to almost all VOCs	Broadband sensor that reacts well to typical VOCs
Average power consumption down to 2.6 mA / 6 mW	Suitable for battery-powered devices
Voltage range of 1.7-3.6 V	Suitable for both mobile and hardwired devices
Digital I ² C interface	Best performance-to-price ratio

SPECIFICATIONS

Gas Sensing Specifications	
VOC Algorithm output	0-500 VOC Index points ¹
Sensor raw output	16-bit ticks ²
Measurement range	0-1,000 ppm of ethanol equivalents
Device-to-device variation	< ± 15 VOC Index points or % m.v. (whichever is larger)
Limit of detection	< 0.05 ppm of ethanol equivalents or < 10% of concentration setpoint (whichever is larger)
Response time (tau 63%)	< 10 s
Switch-on time	< 60 s

Electrical Specifications	
Supply voltage range	1.7-3.6 V
Idle current	34 µA
Current consumption during operation at 1.8 V at 3.3 V	3.5 mA 2.6 mA
Interface	I ² C

¹ Sensirion's VOC Algorithm processes the SGP40 raw signal externally into a ready-to-use air quality signal.

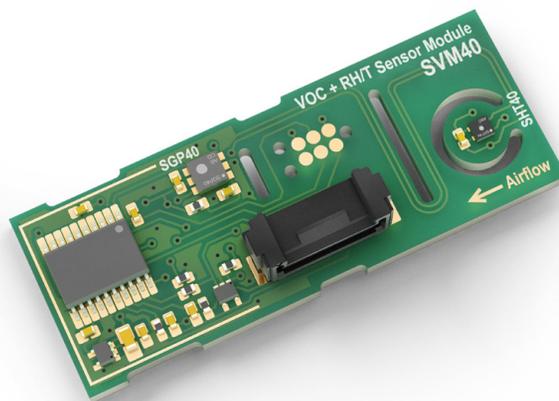
² The SGP40 raw signal is proportional to the logarithm of MOX resistance.

SEK-SVM40 Evaluation Kit

The SEK-SVM40 evaluation kit has been designed for easy and cost-efficient evaluation of Sensirion's SGP40 VOC sensor. The kit contains the SVM40 sensor module and is equipped with an SGP40, a humidity and temperature sensor and a micro-controller featuring VOC Index, relative humidity and temperature outputs via either an I²C or UART interface.

In addition to the SVM40, the SEK-SVM40 comes with a UART-USB cable that allows, e.g., for evaluation of the sensors by Sensirion's easy-to-use SEK-ControlCenter viewer software as well as a 6-pin jumper wire cable that enables fast prototyping, e.g., through integration into existing platforms (like Arduino, Raspberry Pi, etc.). The software and relevant documentation can be downloaded from our website.

Learn more: www.sensirion.com/sek



Environmental Sensing

Environmental conditions have a major impact on our well-being, comfort, and productivity. Sensirion's sensor solutions provide detailed and reliable data on key environmental parameters such as humidity, temperature, volatile organic compounds (VOCs), particulate matter (PM_{2.5}), and CO₂. Environmental Sensing opens up new possibilities to create smarter devices that improve our comfort and well-being as well as increase energy efficiency in a wide variety of applications.

We accompany you through the entire product development process, from the initial idea to product launch and beyond. Our expertise ranges from prototype construction, design-in support and use-case development to inline testing at the mass production stage.

